

Appl. No. 10/516,450  
Amdt. dated July 26, 2007  
Reply to Office Action of January 26, 2007

**Amendments to the Drawings:**

The attached seven (7) replacement sheets of drawings depict Figures 1-7, and include changes to Figures 1-4 and 6-7. The changes provide a description for the y-axis. The attached seven (7) sheets replace the original six (6) sheets of drawings.

Attachment: Replacement Sheets

### **REMARKS**

Claims 1-19 are pending herein. Claims 7-19 stand withdrawn from consideration. Therefore, Claims 1-6 are under review and consideration by the Examiner.

1. The Examiner required that new corrected drawings showing a description for the y-axis be submitted. Attached hereto are seven (7) replacement sheets of drawings depicting Figures 1-7, showing the appropriate revisions. The Examiner is respectfully requested to review and approve the same and make them of record.

2. The disclosure and Claim 5 were objected to for minor informalities, and have been amended. Therefore, it is respectfully requested that the objection to the specification and Claim 5 be withdrawn.

3. Claims 1-6 were provisionally rejected on the ground of nonstatutory obviousness-type double patenting rejection over Claims 9-12 and 22-25 of co-pending application S.N. 10/562,269. As noted by the Examiner that this is a provisional double patenting rejection because the conflicting claims have not yet been patented. Therefore, it is respectfully requested that this rejection be held in abeyance until such time as the '269 application is patented.

4. Claims 1-6 were rejected under 35 U.S.C. §112, second paragraph, as being incomplete for omitting essential steps. Claim 1 has been amended and is

believed to be in full compliance with §112. Therefore, it is respectfully requested that the rejection of Claims 1-6 under 35 U.S.C. §112, second paragraph be withdrawn.

5. Claims 1-6 were rejected under 35 U.S.C. §112, first paragraph. In particular, the Examiner noted that the description of a procoagulant molecule is not adequately described.

Claim 1 has been amended to recite a procoagulant membrane and, in particular, defines that the procoagulant membrane includes a binding site containing phosphatidylserine. In this regard, it is respectfully submitted herewith that the terms "coagulant", "procoagulant", and "phosphatidylserine" are well-known terms, as can be observed from, for example, the attached dictionary definitions (see Dorland's Illustrated Medical Dictionary, 30<sup>th</sup> Edition, pp. 380 and 512 (2003), and Hawley's Condensed Chemical Dictionary, Thirteenth Edition, pp. 872 and 231 (1997)).

In this connection, it is further noted herewith that it is well settled law that the applicants are not required to disclose every species encompassed by the claims even in an unpredictable art. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Further, as the PTO Board added in *Staehelin v. Secher* that "[s]atisfaction of the 'written description' requirement does not require in haec verba antecedence in the originally filed application." 2 USPQ2d 1513, 1519 (B.P.A.I. 1992) (citing *In re Lukach*, 442 F.2d 967, 169 USPQ 795 (C.C.P.A. 1971). The

Board in *Ex parte* Parks further elaborated that:

Adequate description under the first paragraph of 35 U.S.C. 112 does not require *literal* support for the claimed invention....Rather, it is sufficient if the originally-filed disclosure would have conveyed to one having ordinary skill in the art that an appellant has possession of the concept of what is claimed.

30 USPQ 2d 1234, 1236 (citing *In re* Anderson, 471 F.2d 1237, 176 USPQ 331 (C.C.P.A. 1973) (emphasis in original).

Therefore, it is respectfully submitted that the description of a procoagulant molecule, provided in the disclosure, is sufficient to convey to one of ordinary skill in the art that the inventors had possession of the concept of what is being claimed.

In the Office Action, the Examiner noted that there is adequate description of the coagulation molecule recited in the Markush group of Claim 5, but not to the genus of coagulation molecules recited in Claims 1-4 and 6. This statement is not understood. If the various species listed in the Markush group of Claim 5 are adequately described in the disclosure, it is not understood how the genus thereof recited in Claim 4 is not adequately described. In particular, it is not understood that where, as here, the disclosure provides a representative number of species that would lead one of ordinary skill in the art to conclude that the applicants were in possession of the claimed invention, how the genus for those species would not be adequate.

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In view of the above, it is respectfully submitted that Claims 1-6 are in full compliance with §112. Therefore, it is respectfully requested that the rejection of Claims 1-6 under 35 U.S.C. §112, first paragraph, be withdrawn.

### **CONCLUSION**

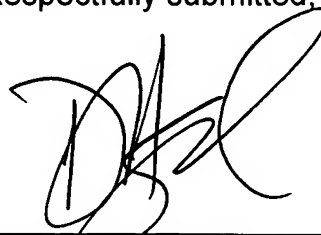
For the foregoing reasons, it is respectfully submitted that Claims 1-6 are in condition for allowance. Withdrawal of all the objections and rejections and allowance of these claims is respectfully submitted.

It is believed that no additional fee is due for this submission. Should that determination be incorrect, however, the Commissioner is hereby authorized to charge any deficiencies, or credit any overpayment, to our Deposit Account No. 01-0433, and notify the undersigned in due course.

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Should the Examiner have any questions or wish to discuss further this matter, please contact the undersigned at the telephone number provided below.

Respectfully submitted,

A handwritten signature in black ink, appearing to be 'DAGARWAL', written over a horizontal line.

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DORLAND'S

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ILLUSTRATED

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MEDICAL<sup>30th</sup>  
EDITION

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DICTIONARY

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**CMAP** compound muscle action potential.

**CMD** cerebromacular degeneration.

**CMF** a cancer chemotherapy regimen consisting of cyclophosphamide, methotrexate, and 5-fluorouracil.

**CMHC** community mental health center.

**cm H<sub>2</sub>O** centimeter of water, a unit of pressure equal to that exerted by a column of water at 4°C one millimeter high at mean sea level; officially defined as the pressure exerted by a 1 cm column of fluid with a density of 1 g/cm<sup>3</sup> in a gravitational field of 9.80665 m/s<sup>2</sup>, which equals 9.80665 pascals.

**CMI** cell-mediated immunity.

**CML** cell-mediated lympholysis.

**c mm** cubic millimeter.

**C-MOPP** a cancer chemotherapy regimen consisting of cyclophosphamide, Oncovin (vincristine), procarbazine, and prednisone.

**CMP** cytidine monophosphate.

**c.m.s.** [L.] cras ma'ne sumen'dus (to be taken tomorrow morning).

**CMT** California mastitis test; Certified Medical Transcriptionist.

**CMV** cytomegalovirus.

**CN** chloroacetophenone.

**c.n.** [L.] cras noc'te (tomorrow night).

**CNA** Canadian Nurses Association.

**CN-Cbl** cyanocobalamin.

**C3 NeF** C3 nephritic factor.

**cne-mi-al** (ne'me-əl) tibial.

**Cne-mi-do-cop'tes** (ne'mī-do-kop'tēz) *Knemidokoptes*.

**cne-mis** (ne'mis) tibia.

**cne-mi-tis** (ne-mi'tis) inflammation of the tibia.

**cne-mo-sco-ll-o-sis** (ne'mo-sko'lle-o'sis) [Gr. *knēmē* leg + *scolio-* + *-sis*] a lateral bending of the lower limb.

**cnl-cln** (ni'sin) an amaroid that is the main active constituent of blessed thistle.

**Cnl-cus** (ni'kəs) [Gr. *knēkos* safflower] a genus of European herbs of the family Compositae; *C. benedictus* (blessed thistle) is medicinal.

**Cnl-da-ria** (ni-dar'e-ə) [Gr. *knidē* a nettle] a phylum of marine invertebrates that includes sea anemones, hydras, corals, and jellyfish (all of which were formerly assigned to the phylum Coelenterata), plus comb jellies or sea walnuts, characterized by a radially symmetrical body bearing tentacles around the mouth.

**cnl-dar-i-an** (ni-dar'e-ən) 1. pertaining or belonging to the phylum Cnidaria. 2. an individual of the phylum Cnidaria. See also *coelenterate* (def. 3).

**Cnl-di-an** (ni'de-ən) pertaining to Cnidos, a Dorian Greek city on the southwest Asia Minor coast famous for its temple of healing, its medical school, and its libraries. The Cnidian school stressed thorough diagnosis and classification of diseases (especially pathology) to the extent of ignoring the patient. Cf. *Hippocrates of Cos*.

**cnld(o)-** [Gr. *knidē* a nettle] a combining form denoting a relationship to a nettle or nettle-like structure.

**cnl-do-blast** (ni'do-blast) [*cnido-* + *-blast*] the epidermal cells of coelenterates which contain the nematocysts, especially numerous on the tentacles.

**cnl-do-cil** (ni'do-sil) [*cnido-* + *cilum*] a bristle-like process at one end of a cnidoblast, which, when stimulated, triggers the discharge of the nematocyst.

**Cnl-dos-po-ra** (ni'dos'pə-rə) [*cnido-* + *spore*] Microspora.

**Cnl-do-spo-rid-la** (ni'do-spo-rid'e-ə) Microsporidia.

**CNM** Certified Nurse-Midwife; see *nurse-midwife*.

**CNS** central nervous system.

**c.n.s.** [L.] cras noc'te sumen'dus (to be taken tomorrow night).

**CNV** contingent negative variation.

**CO** cardiac output.

**Co** cobalt; coccygeal (in vertebral formulas).

**co-** see *con-*.

**COA** Canadian Orthopaedic Association.

**CoA** coenzyme A.

**co-ac-er-vate** (ko-as'ər-vāt) [L. *coacervatus* heaped up] the viscous phase separating from a colloid-containing system in the phenomenon of coacervation.

**co-ac-er-va-tion** (ko-as'ər-va'shən) the separation of a mixture of two liquids, one or both of which are colloids, into two phases, one of which (the coacervate) contains the colloidal particles, the other an aqueous solution, e.g., as when gum arabic is added to gelatin.

**co-ad-ap-ta-tion** (ko-ad'ap-ta'shən) [*co-* + *adaptation*] the correlated, adaptive changes in two interdependent organs.

**co-ad-u-na-tion** (ko-ad'u-na'shən) [*co-* + *ad-* + L. *unus* one] the combination of dissimilar substances in one mass.

**co-ad-u-ni-tion** (ko-ad'u-nish'ən) coadunation.

**co-ag-glu-ti-na-tion** (ko'ə-gloo'ti-na'shən) the aggregation of antigenic particulate antigens combined with agglutinins of more than one species.

**co-ag-u-la-bil-i-ty** (ko-ag'u-lā-bil'i-ty) the state of being coagulable.

**co-ag-u-la-ble** (ko-ag'u-lā-bəl) capable of being formed into a clot.

**co-ag-u-lant** (ko-ag'u-lənt) [L. *coagulare*] 1. promoting, accelerating, or making possible the coagulation of blood. 2. an agent that promotes or accelerates the coagulation of blood.

**co-ag-u-lase** (ko-ag'u-lās) a bacterial enzyme that reacts with fibrinogen as a cofactor found in blood plasma to catalyze the formation of fibrin from fibrinogen. It is produced by *Staphylococcus aureus* and by *Yersinia enterocolitica*.

**co-ag-u-late** (ko-ag'u-lāt) [L. *coagulare*] 1. to undergo coagulation. 2. to cause to undergo coagulation or clotting.

**co-ag-u-la-tion** (ko-ag'u-lā'shən) [L. *coagulatio*] 1. in colloidal chemistry, the solidification of a sol into a gelatinous mass; an alternate phase or of a dissolved solid which causes the separation of the system into a liquid phase and an insoluble mass called the clot or coagulum, usually irreversible. Called also *clotting*. 2. blood c. 3. in surgery, the disruption of tissue by physical means to form an amorphous residue in electrocoagulation and photocoagulation.

**blood c.** the sequential process by which the multiple coagulation factors of the blood interact in the coagulation cascade, ultimately resulting in the formation of an insoluble fibrin clot. See also *intrinsic*, and *common pathways of coagulation*.

**diffuse intravascular c. (DIC)**, disseminated intravascular coagulation, a bleeding disorder characterized by abnormal reduction in the amount of fibrinogen involved in blood clotting due to their use in widespread intravascular clotting. It may be caused by any of numerous disorders; in the DIC, it is marked by profuse hemorrhaging. Called also *consumption coagulation*, *defibrination syndrome*, and *disseminated intravascular coagulation syndrome*.

**massive c.** coagulation of the spinal fluid so as to form a solid clot; a condition seen in some cases of Froin's syndrome, meningomyelitis or tumor of the cord.

**co-ag-u-la-tive** (ko-ag'u-lā-tiv) associated with coagulation; pertaining to a process of coagulation; of the nature of coagulation.

**co-ag-u-la-tor** (ko-ag'u-lā'tər) a surgical device that utilizes a high-frequency current or light to stop bleeding.

**argon beam c. (ABC)** a device consisting of a needle inserted inside a probe through which argon gas is passed; the end of the electrode is carried by the jet of argon, which is directed at the tissue to effect hemostasis.

**co-ag-u-lo-gram** (ko-ag'u-lo-gram") a term used colloquially in clinical hematology to denote a series of laboratory tests measuring various parameters of hemostasis.

**co-ag-u-lo-p-a-thy** (ko-ag'u-lo-p'ə-the) any disorder of blood coagulation.

**consumption c.** diffuse intravascular coagulation.

**co-ag-u-lum** (ko-ag'u-ləm) pl. *coagula* [L.] clot (def. 1).

**closing c.** Schlusskoagulum.

**co-a-les-cence** (ko'ə-les'əns) [L. *coalescere* to grow together] fusion or blending of parts.

**co-a-ll-tion** (ko'ə-lish'ən) [L. *coalescere* to grow together] the union of parts that are normally separate.

**calcaneocuboid c.** an often asymptomatic tarsal coalition between the calcaneus and the cuboid bone.

**calcaneonavicular c.** one of the most common types of tarsal coalition, involving the calcaneus and the navicular bone.

**cubonavicular c.** tarsal coalition involving the cuboid and the navicular bones.

**naviculocuneiform c.** tarsal coalition involving the navicular and the cuneiform bones.

**talocalcaneal c.** one of the most common types of tarsal coalition involving the talus and calcaneus.

**talonavicular c.** tarsal coalition involving the talus and the navicular bone.

**tarsal c.** the fibrous, cartilaginous, or bony fusion of two or more of the tarsal bones, often resulting in talipes planovalgus, although deformities occur and some patients are asymptomatic; in

## Processus Continued

**p. vagina'lis tes'tis** see *p. vaginalis peritonei*.

**p. vermifor'mis** appendix vermiformis.

**p. voca'lis** [TA] vocal process: the process of the arytenoid cartilage to which the vocal ligament is attached.

**p. xiphol'deus** [TA] xiphoid process: the pointed process of cartilage, supported by a core of bone, connected with the lower end of the body of the sternum. Called also *ensiform*, *mucronate*, or *xiphoid cartilage*; *xiphoid bone*; and *xiphisternum*.

**p. zygoma'ticus maxil'lae** [TA] zygomatic process of maxilla: the rough triangular eminence that articulates with the zygomatic bone and marks the separation of the facies anterior, infratemporalis, and orbitalis.

**p. zygoma'ticus os'sis fronta'lis** [TA] zygomatic process of frontal bone: a thick, strong process of the frontal bone, situated at the lateral end of the supraorbital margin and articulating with the zygomatic bone, and from which the temporal line starts.

**p. zygoma'ticus os'sis tempora'lis** [TA] zygomatic process of temporal bone: a long, strong process arising from the inferior portion of the squamous part of the temporal bone, passing anteriorly from just superior to the entrance of the external acoustic



Manubrium  
sterni

Body of  
sternum

Xiphoid process  
(processus xiphoideus)

meatus to join the zygomatic bone and thus forming the arch. It has an anterior root and a posterior root extending to the temporal bone.

**pro-chel-ion** (pro-ki'lon) [*pro-* + Gr. *cheilon* lip] tuberculum labii superioris.

**Pro-chlo-ro-phy-ta** (pro'klo-ro-fi'ta) [*pro-* + *chloro-* + Gr. *phyton* plant] a subgroup of bacteria of the class Oxyphotobacteria, consisting of prokaryotic, unicellular, green, spheroid to ovoid organisms found associated with sea squirts in tropical coastal waters. They contain chlorophyll and are photosynthetic, using water as an electron donor and producing oxygen, and they fix carbon dioxide.

**pro-chlor-pem-a-zine** (pro'klor-pem'a-zen) prochlorperazine.

**pro-chlor-per-a-zine** (pro'klor-per'a-zen) [USP] a phenothiazine derivative used chiefly as an antiemetic, although it is sometimes used as an antipsychotic or antianxiety agent, administered rectally. Called also *prochlorperazine*.

**p. edisylate** [USP] the ethanedisulfonate salt of prochlorperazine, having the same actions and uses as the base; administered orally, intramuscularly, or intravenously.

**p. maleate** [USP] the maleate salt of prochlorperazine, having the same actions and uses as the base; administered orally.

**pro-chon-dral** (pro-kon'dral) occurring previous to the formation of cartilage.

**pro-chor-dal** (pro-kor'dal) prechordal.

**pro-chro-mo-some** (pro-kro'ma-som) a chromosome-like body occurring in resting nuclei.

**pro-chy-mo-sin** (pro-ki'mo-sin) the inactive precursor of chymosin (rennin), converted to chymosin by pepsin or autocatalytically.

**pro-ci-den-tia** (pro'si-den'sha) [L.] 1. prolapse. 2. specifically, prolapse of the uterus to such a degree that the cervix protrudes from the vaginal outlet.

**pro-co-ag-u-lant** (pro'ko-ag'u-lant) 1. tending to favor the occurrence of coagulation. 2. a precursor of a natural substance necessary to coagulation of the blood.

**pro-col-la-gen** (pro-kol'a-jen) the precursor molecule of collagen, synthesized in the fibroblast, osteoblast, etc., and cleaved to form collagen extracellularly.

**pro-col-la-gen C-en-do-pep-ti-dase** (pro-kol'a-jen en'do-pep'ti-das) [EC 3.4.24.19] an extracellular endopeptidase that catalyzes the cleavage of the C-terminal extension from procollagen, a step in the synthesis of collagen fibers. The enzyme does not require the procollagen substrate to be an intact trimer.

**pro-col-la-gen C-pro-tei-n-ase** (pro-kol'a-jen pro'ten-as) procollagen C-endopeptidase.

**pro-col-la-gen gal-lac-to-syl-trans-fer-ase** (pro-kol'a-jen gal'ak-tos'al-trans'fer-as) [EC 2.4.1.50] an enzyme of the transferase class that catalyzes the attachment of galactose to hydroxylysine residues in the synthesis of collagen. The donor of the galactose moiety is UDP galactose, and the enzyme is specific for collagen that is not yet in triple helical form.

**pro-col-la-gen glu-co-syl-trans-fer-ase** (pro-kol'a-jen glu'ko-syl-trans'fer-as) [EC 2.4.1.66] an enzyme of the transferase class that catalyzes the attachment of glucose to some of the galactose hydroxylysine residues during the synthesis of collagen. The glucose moiety is UDPglucose, and the enzyme is specific for collagen that is not yet in triple helical form.

**pro-col-la-gen-ly-sine 5-di-oxy-gen-ase** (pro-kol'a-jen ly'sin 5-di-ok'si-jen-as) [EC 1.14.11.4] EC nomenclature for *lysyl oxidase*.

**pro-col-la-gen N-en-do-pep-ti-dase** (pro-kol'a-jen en'do-pep'ti-das) [EC 3.4.24.14] an extracellular endopeptidase that catalyzes the cleavage of the N-terminal extension from procollagen, a step in the synthesis of collagen. The enzyme requires an intact procollagen trimer.

**pro-col-la-gen N-pro-tei-n-ase** (pro-kol'a-jen pro'ten-as) procollagen N-endopeptidase.

**pro-col-la-gen pep-ti-dase** (pro-kol'a-jen pep'ti-das) an enzyme that catalyzes the cleavage of specific terminal amino acid residues from procollagen chains, specifically used to denote procollagen C-endopeptidase (q.v.) and procollagen C-endopeptidase (q.v.).

**pro-col-la-gen-pro-ly-sine di-oxy-gen-ase** (pro-kol'a-jen pro'ly-sin di-ok'si-jen-as) [EC 1.14.11.2] EC nomenclature for *lysyl oxidase*.

**pro-col-la-gen-pro-ly-sine 3-di-oxy-gen-ase** (pro-kol'a-jen pro'ly-sin 3-di-ok'si-jen-as) [EC 1.14.11.7] EC nomenclature for *lysyl oxidase*.

**pro-con-cep-tive** (pro'kan-sep'tiv) 1. aiding or promoting conception. 2. an agent that facilitates or promotes conception.

**pro-con-ver-tin** (pro'kan-ver'tin) factor VII, see *prothrombin*, at *factor*.

**pro-cre-a-tion** (pro'kre-a'shon) [L. *procreatio*] the act of bringing a new individual into the world.

**pro-cre-a-tive** (pro'kre-a'tiv) concerned in procreation.

**Pro-crit** (pro'krit) trademark for a preparation of prothrombin.

**proc-tal-gla** (prok-tal'ja) [*proct-* + *-algia*] neuralgia of the rectum.

**p. fu'gax** episodic severe pain in the rectum, or in the sigmoid colon, occurring at night; it is attributed to spasm of the levator ani muscles.

**proc-ta-tre-sia** (prok'ta-tre'zha) [*proct-* + *atresia*] stricture of the rectum.

**proc-tec-ta-sia** (prok'tek-ta'zha) [*proct-* + *ectasia*] dilatation of the rectum or of the anus.

**proc-tec-to-my** (prok'tek-ta-me) [*proct-* + *ectomy*] surgical removal of the rectum.

**proc-ten-clel-sis** (prok'ten-kli'sis) [*proct-* + Gr. *tenekle*] constriction, or stenosis, of the lower rectum; also *proc-ten-osis*.

**proc-teu-ryn-ter** (prok'tu-rin'ter) [*proct-* + Gr. *teu*] a baglike device used in dilating the rectum.

**proc-teu-ry-sis** (prok-tu'ri-sis) dilatation of the rectum; *procteurysis*.

**proc-ti-tis** (prok-ti'tis) [*proct-* + *-itis*] inflammation of the rectum.

*Hawley's*  
*Condensed Chemical*  
*Dictionary*

**THIRTEENTH EDITION**

*Revised by*  
Richard J. Lewis, Sr.



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**"Phos-chek P-30 and P-40" [Monsanto].**

TM for ammonium polyphosphate.

Grade: Regular and fine white powder.

Use: Phosphorus-based catalyst in organic and latex-based fire-retardant intumescent paints, mastics, and polymers.

**"Phosdrin" [Shell].** TM for a mixture containing more than 60% of the  $\alpha$  isomer of 2-( $\text{CH}_3\text{O}$ )<sub>2</sub>P(O)OC( $\text{CH}_3$ ):CHCOOCH<sub>3</sub> (generic name mevinphos) and less than 40% of insecticidally active related compounds. It is 100% active.

See mevinphos.

**"Phosflake" [PPG].** TM for a uniform blend of caustic soda and trisodium phosphate prepared in flake form, especially for bottle-washing use.

**phosgene.** (carbonyl chloride; carbon oxychloride; chloroformyl chloride).

CAS: 75-44-5.  $\text{COCl}_2$ .

Properties: Liquid or easily liquefied gas, colorless to light yellow; odor varies from strong and stifling when concentrated to haylike in dilute form. D 1.392 (19/4C), fp  $-128^\circ\text{C}$ , bp  $8.2^\circ\text{C}$ , sp vol 3.9 cu ft/lb (21.1C). Slightly soluble in water and slowly hydrolyzed by it; soluble in benzene and toluene. Noncombustible.

Derivation: By passing a mixture of carbon monoxide and chlorine over activated carbon.

Hazard: Very toxic via inhalation, strong irritant to eyes. TLV: 0.1 ppm in air.

Use: Organic synthesis, especially of isocyanates, polyurethane and polycarbonate resins, carbamates, organic carbonates, and chloroformates; pesticides; herbicides; dye manufacture.

**phosmet.**

CAS: 732-11-6.  $\text{C}_{11}\text{H}_{12}\text{NO}_4\text{PS}_2$ . A dimethyl ester of phosphorodithioic acid.

Properties: Colorless crystals. Mp  $72^\circ\text{C}$ . Partially soluble in water; decomposes on heating.

Hazard: Toxic by ingestion, may inhibit cholinesterase.

Use: Acaricide, insecticide.

**phosphamidon.** (2-chloro-2-diethylcarbamoyl-1-methylvinyl dimethyl phosphate).

CAS: 13171-21-6.

$(\text{CH}_3\text{O})_2\text{P}(\text{O})\text{OC}(\text{CH}_3):\text{C}(\text{Cl})\text{C}(\text{O})\text{N}(\text{C}_2\text{H}_5)_2$ .

Properties: Colorless liquid. Bp  $162^\circ\text{C}$  (1.5 mm Hg). Soluble in water and organic solvents.

Hazard: Toxic by ingestion, inhalation, skin absorption; cholinesterase inhibitor; use may be restricted.

Use: Insecticide.

**phosphatase, alkaline.** An enzyme excreted into the bile by the liver and found in the blood. It is concerned with bone formation, probably being produced by osteoblasts. It hydrolyzes phosphoric acid esters at pH 7-8, liberating phosphate ions.

Use: Biochemical research.

**phosphate, condensed.** A phosphorus compound with two or more phosphorus atoms in the molecule. Examples are polyphosphates, pyrophosphates.

See polyphosphoric acid.

**phosphate glass.** A type of glass containing phosphorus pentoxide. Aluminum-metaphosphate is frequently the basic material. Such glasses have properties not attainable in silicate glasses, e.g., resistance to hydrogen fluoride.

**phosphate rock.** (phosphorite). A natural rock consisting largely of calcium phosphate and used as a raw material for manufacture of phosphate fertilizers, phosphoric acid, phosphorus, and animal feeds. Recovery of uranium from the manufacture of phosphoric acid and other phosphate chemicals is expected to become an important source of this metal. Phosphate rock is the primary source of superphosphate, prepared by treatment of the pulverized rock with sulfuric acid (superphosphate having 16-18%  $\text{P}_2\text{O}_5$ ) or by acidifying with phosphoric acid (triple superphosphate having 40-48%  $\text{P}_2\text{O}_5$ ). Nitric acid is sometimes used, i.e., nitrophosphate. Defluorinated phosphate rock is the source of phosphate used in animal feeds and feed concentrations. Important deposits are in the U.S. (Florida, North Carolina, Tennessee, California, Wyoming, Montana, Utah, Idaho), North Africa (Morocco, Libya, Algeria), the former U.S.S.R., and various islands in the Pacific.

**phosphate slag.** Glassy calcium silicate, by-product of electric furnace phosphorus manufacture.

Properties: Lumps, loose bulk d 85 lb/ft<sup>3</sup>.

**phosphatide.** See phospholipid.

**phosphatidyl choline.** See lecithin.

**phosphatidyl ethanolamine.** See cephalin.

**phosphatidyl serine.** See cephalin.

**phosphazene.** (phosphonitrile). A ring or chain polymer that contains alternating phosphorus and nitrogen atoms with two substituents on each phosphorus atom. Characteristic structures are cyclic trimers, cyclic tetramers, and high polymers. The substituent can be any of a wide variety of organic groups, halogen, amino, etc. Most cyclic trimers are crystalline, solids, organosoluble, and stable to weather conditions; the high polymers (polyphosphazenes) are elastomeric or thermoplastic. A copolymer of phosphazene and styrene has been investigated for use as a flame-retardant.

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**centistoke.** (cS). 1/100 stoke, the unit of kinematic viscosity. The kinematic viscosity in stokes is equal to the viscosity in poises divided by the density of the fluid in grams per cubic centimeter, both measured at the same temperature.

**centrifugation.** A separation technique based on the application of centrifugal force to a mixture or suspension of materials of closely similar densities. The smaller the difference in density, the greater the force required. The equipment used (centrifuge) is a chamber revolving at high speed (10,000 rpm or more) to impart a force up to 17,000 times gravity. The materials of higher density are thrown toward the outer portion of the chamber while those of lower density are concentrated in the inner portion. This technique is used effectively in a number of biological and industrial operations, such as separation of the components of blood, concentration of rubber latex, and separation of fat particles from other milk components. Separation of isotopes, e.g., those of uranium, by this method is now practicable for producing enriched uranium. This method is economically superior to the gaseous diffusion process.

See ultracentrifuge.

**centrifuge.** See centrifugation; ultracentrifuge.

**centroid diagram.** A chart showing relationship of atomic electron energy levels in successive elements.

**cephalin.** (kephalin; phosphatidyl ethanolamine; phosphatidylserine).

$\text{CH}_2\text{OR}, \text{CHOR}, \text{CH}_2\text{OP}(\text{O})(\text{OH})\text{OR}_3$ . A group of phospholipids in which two fatty acids ( $\text{R}_1$  and  $\text{R}_2$ ) form ester linkages with the two hydroxyl groups of glycerophosphoric acid, and either ethanolamine or serine ( $\text{R}_3$ ) forms an ester linkage with the phosphate group. Cephalins are therefore either phosphatidylethanolamine or phosphatidylserine. They are associated with lecithins found in brain tissue, nerve tissue, and egg yolk.

**Properties:** Yellowish, amorphous substance; characteristic odor and taste. Insoluble in water and acetone; soluble in chloroform and ether; slightly soluble in alcohol.

**Use:** Medicine, biochemical research.

**cephalosporin.** Any of a family of antibiotics related to penicillin, discovered in 1953; an important member of this group was synthesized by Woodward in 1966. Several cephalosporins are used clinically (cephalothin, cephaloridine, and cephalixin). The molecule contains a fused  $\beta$ -lactam-dihydrothiazine ring system with an *N*-acyl side chain and an acetoxy group attached to the dihydrothiazine

ring. The formula for cephalosporin (C) is  $\text{C}_{16}\text{H}_{21}\text{N}_3\text{O}_6\text{S}$ . Cephalosporins are reported to be free from the allergic reactions common with penicillin. Development of new cephalosporin derivatives is being actively pursued.

See penicillin; antibiotic.

**cephamycin.** Any of a group of antibiotics related to cephalosporins and produced by several species of *Streptomyces*.

**"CERAMER" [Petrolite].** TM for a modified hydrocarbon wax.

**ceramic.** A product, manufactured by the action of heat on earthy raw materials, in which silicon and its oxide and complex compounds and silicates occupy a predominant position (American Ceramic Society). The chief groups of the industry are as follows: (1) structural clay (brick, tile, terra-cotta, glazed architectural tile); (2) whitewares (dinnerware, chemical and porcelain, e.g., spark plugs, sanitary ware, tile); (3) glass products of all types; (4) enamels; (5) refractories (materials that withstand high temperatures); (6) Portland cement, li ter, and gypsum products; (7) abrasive products; (8) aluminum silicate fibers. A wide range of ceramics are available as ultrafine (10–150 microns), and ceramic foams are commercially.

For further information, refer to the American Ceramic Society, 4055 North High St., Columbus, OH 43266.

**ceramic, ferroelectric.** A unique type of polycrystalline ceramic having properties that make possible the production of reliable, high-density optical memories for computers that are more efficient than conventional types. Lead zirconate titanate, heated and pressed into thin plates, is one of the compounds used. As a result of its ferroelectric properties, an applied voltage aligns the electric charges in the molecules of ceramic in the direction of the field and the polarization so induced remains indefinitely. Thus, the material accommodates itself to the requirements of the digital system, namely, binary 0 and binary 1.

See ferroelectric.

**ceramic, glass.** See glass ceramic.

**"Ceramix" [PPG].** TM for a technical grade of barium carbonate used in the ceramic industry. **Hazard:** See barium.

**"Ceratak" [Petrolite].** TM for a grade of petroleum microcrystalline wax, min mp 73.8C.

**"Cerathane" 63-L [Petrolite].** TM for an emulsifiable microcrystalline wax, min mp 93.3C.



## APPENDIX